DOCUMENT RESUME

ED 462 954 IR 021 113

AUTHOR	Dijkstra, Sanne; Collis, Betty; Eseryel, Deniz
TITLE	Instructional Design of WWW-Based Course-Support Environments: From Case to General Principles.
PUB DATE	1999-00-00
NOTE	9p.; In: ED-MEDIA 99 World Conference on Educational Multimedia and Hypermedia & World Conference on Educational Telecommunications. Proceedings (11th, Seattle, Washington, June 19-24, 1999); see ED 446 728.
PUB TYPE	Reports - Descriptive (141) -- Speeches/Meeting Papers (150)
EDRS PRICE	MF01/PC01 Plus Postage.
DESCRIPTORS	Computer Mediated Communication; Educational Technology; *Educational Theories; Higher Education; *Instructional Design; Instructional Materials; Material Development; Online Systems; World Wide Web

ABSTRACT

This paper describes the design of a World Wide Web-based course support environment for a course in instruction design theories. An overview of how the environment was used as part of the course experience is given, and the student evaluation of the course is summarized. The paper concludes that such a course-support environment can extend the teaching and learning process, if well designed, by bringing added self responsibility. Such a tool is not seen as replacing the instructor, but extending him or her. The design of the environment should reflect this. Although this paper describes the particular case of a course about instructional design, it argues that the conclusions can be valid for courses of a variety of disciplines and instructional approaches. One figure shows the roster of the "Instructional Design Theories" course support site. (AEF)

Reproductions supplied by EDRS are the best that can be made
from the original document.

ED 462 954

Instructional Design of WWW-Based Course-Support Environments: From Case to General Principles.

Sanne Dijkstra
Betty Collis
Deniz Eseryel

U.S. DEPARTMENT OF EDUCATION
Office of Educational Research and Improvement
EDUCATIONAL RESOURCES
INFORMATION CENTER (ERIC)

❑ This document has been reproduced as received from the person or organization originating it.

❑ Minor changes have been made to improve reproduction quality.

• Points of view or opinions stated in this document do not necessarily represent official OERI position or policy.

PERMISSION TO REPRODUCE AND DISSEMINATE THIS MATERIAL HAS BEEN GRANTED BY

D. Eseryel

TO THE EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC)

1

IR 021 113

BEST COPY AVAILABLE

Instructional Design of WWW-Based Course-Support Environments: From Case to General Principles.

Sanne Dijkstra, Betty Collis, Deniz Eseryel

Faculty of Educational Science and Technology

University of Twente,

Postbus 217, 7500 AE Enschede, The Netherlands

E:mail: dijkstra@edte.utwente.nl, collis@edte.utwente.nl, eseryel@edte.utwente.nl

REFERENCE: Dijkstra, S., Collis, B., & Eseryel, D. (1999). Instructional Design of WWW-Based Course-Support Environments: From Case to General Principles. In B. Collis and R. Oliver (Eds.) *Proceedings of ED-MEDIA 99: World Conference on Educational Multimedia, Hypermedia, & Telecommunications*, June 19-24 (pp. 231-235). Seattle, Washington: Association for Advancement of Computing in Education.

ABSTRACT: In this paper we describe the design of a WWW-based course-support environment for a course in instructional-design theories, give an overview of how the environment was used as part of the course experience, and summarize the student evaluation of the course. Our conclusion is that such a course-support environment can extend the teaching and learning process, if well designed, by bringing added opportunities for communication, coaching, and the increase of student self responsibility. We do not see such a tool as replacing the instructor, but extending him or her. The design of the environment should reflect this. Although the article describes the particular case of a course about instructional design, we argue that the conclusions can be valid for courses of a variety of disciplines and instructional approaches.

Introduction

Despite the sophistication of many computer-related learning materials, we believe that sooner or later a teacher is required to motivate the students, to coach the students in the use of problem-solving methods, to explain the descriptions and interpretations of the subject matter, and to model the learning and practicing of skills. However, the typical classroom or course setting is not particularly conducive to stimulating communication with individual students in order to recognize their intellectual and motivational problems, to explain to them a difficult part of the subject matter, to provide clear tasks, and to coach the students' problem-solving activity. The often-repeated criticism of the whole-class approach has done little yet to change the system and increase personal contacts and coaching between the teacher and individual students.

IR021113

We believe that the integration of computer technology with data communication, what is called in Europe telematics, creates new possibilities to support and amplify the communication between a teacher and the students and among the students themselves even in a large class; increases the opportunities for the instructor to coach on an individual basis; and provides the students a possibility to become more self-reliant in their approach to studying, while still retaining the benefits of the familiar face-to-face class setting and textbook. WWW-based environments in particular can combine the strengths of computer-based learning with those of instructor-guided learning and can help to overcome the mass-production aspects of the large course in higher education. But how does one design a WWW-based course-support environment to reflect this instructional philosophy? Are there instructional-design principles to follow? We address these questions via an example, a course about instructional design at the Faculty of Educational Science and Technology of the University of Twente in The Netherlands. The case we describe is just one of over 30 courses in our faculty that are taking advantage of WWW-based course-support environments to enrich teaching and learning, for students in the regular institutional setting as well as students sometimes or even primarily at a distance from that setting (see Tielemans & Collis, 1998).

A Description of the Course Instructional Design Theories

Instructional Design Theories is a 120-hour senior course in the Faculty of Educational Science and Technology at the University of Twente. Students in the course represent a mixed cohort, in terms of background relating to the theoretical principles relating to instructional design and of mother tongue. The language used in the course is English. The textbook used for the course is a scholarly analysis of the theoretical foundations of instructional design and of key research approaches (Tennyson, Schott, Seel, & Dijkstra, 1997). Moreover the meaning of the theories for solving instructional-design problems is shown (Dijkstra, Seel, Schott, & Tennyson, 1997). Because the students have different levels of prior knowledge coming into the course, their learning needs are different.

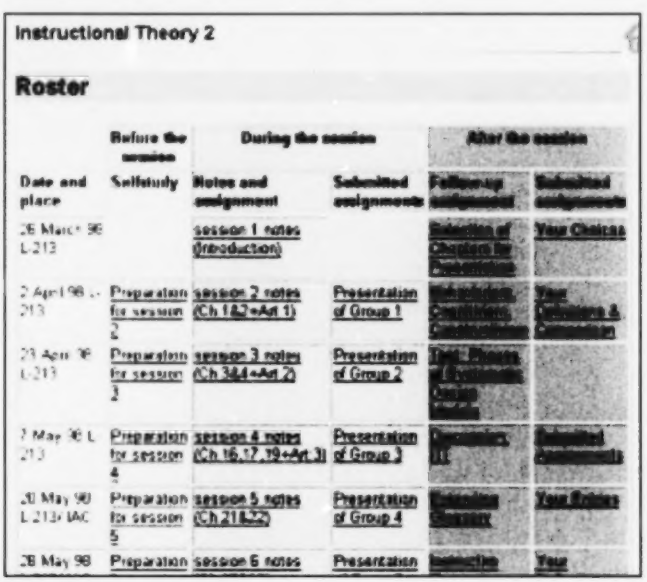
Design of the WWW-Based Course-Support Environment

Based on this, and also the key principles for all students of (a) supporting and amplifying the communication between the teacher and the students and among the students themselves, (b) increasing the opportunities for the instructor to coach students on an individual basis, and (c) providing the students the possibility to become more self-reliant in their approach to studying, the following requirements were established for a WWW environment to support the course:

- The site should provide access to prerequisite knowledge for those who need it.
- Examples of how instructional-design theories and models are applied in practice should be available
- The information presented in the textbook should be extended by showing different perspectives in the topics discussed
- The meaning of critical terms should be clarified

- The students should be supported in searching for additional resources and examples illustrating the course concepts via the WWW
- The students should be motivated and supported in discussing and sharing information.

Using the possibilities made available through the *TeleTOP* database-generated course-support system at the faculty (see http://teletop.edte.utwente.nl, and also Tielemans & Collis, 1998; De Boer & Collis, 1998a,b) a course-support environment was created with the following basic components: (a) a news/update area, for general communication from the instructor to the students; (b) a matrix-like roster, in which the weekly organization of the course is given, and linked to this extra study materials, links to discussions, opportunities for students to enter assignments and new materials into the course site, and for the instructor and other students to give feedback; (c) a communication area, supporting direct e-mail among all participants in the course; (d) a section with general information and background about the course; (e) a shared-workspace area where groups of students can work and discuss together on topics in the course; (f) a glossary, with communication options added so that students can suggest new entries or ask for clarification about terms; and (h) a resources area containing a large number of links to external resources relevant to the course, some to serve as prerequisite material, some for illustration of concepts and theories, and others to serve as enrichment and examples of professional interactions relating to instructional design. Figure 1 shows the roster of the course.



Instructional Theory 2

Roster

	Before the session	During the session		After the session	
Date and place	Self study	Notes and assignment	Submitted assignments	Follow-up assignment	Submitted assignments
26 Mar '98 L-213		session 1 notes (Introduction)		Selection of Chapters for discussion	Your Choices
2 Apr 98 L-213	Preparation for session 2	session 2 notes (Ch 1&2+Art 1)	Presentation of Group 1	Introduction, conditions, Communication	Your Opinions & Comments
23 Apr '98 L-213	Preparation for session 3	session 3 notes (Ch 3&4+Art 2)	Presentation of Group 2	Your Phrases (Communication, Group work)	
7 May '98 L-213	Preparation for session 4	session 4 notes (Ch 16,17,19+Art 3)	Presentation of Group 3	Comments, ...	Submitted Assignments
30 May '98 L-213/ IAC	Preparation for session 5	session 5 notes (Ch 21&22)	Presentation of Group 4	Concluding Session	Your Points
28 May 98	Preparation	session 6 notes	Presentation	Instruction	Your

Figure 1. Roster of the *Instructional Design Theories* course-support site.

BEST COPY AVAILABLE

A closer look at the roster

The roster works as a course organizer. For each session, it shows the date and place of the session, gives links to self-study activities that should take place before the session, links to notes to accompany the face-to-face session, links to materials created by the students for presentation during the face-to-face sessions, and follow-up activities after the session. The session notes are prepared by the instructor to help the students deal with each of the chapters and topics in the course. The notes also allow the instructor to update the material, add links to views of other specialists, provide links for further exploration, and to illustrate concepts with examples and real-life applications.

There were three types of follow-up assignments: discussion questions, assignments relating to the creation of reports, and self-tests. For the discussion assignments, students took part in discussions relating to instruction-design issues available via the Internet. This serves to increase their sense of the application of the concepts in the study materials, and also helps them to articulate and defend their own ideas. They also discussed among themselves, using the shared workspace, each entering some reflections and then commenting on the reflections of the other students in their group. The instructor occasionally intervened, to support and motivate, but the main focus was on communication with others in the field as well as one's classmates. For the report-type assignments, students needed to search the Internet to find additional resources to support their ideas. Also, they posted their reports on the course site for peer-review. Again, the instructor coached and commented on an individual basis when useful. The TeleTOP course environment allowed the easy entry of comments and files, as well as feedback and follow-up to materials that have been entered; all the instructor and students need to do to type in their responses or upload previously created files. The entries are immediately entered into the course database and integrated into the course WWW environment. The self-testing was done with Java-enabled test items that provide immediate feedback after the student submits an answer. The students were free to make as much use of these resources as they wished. An important part of the course site was the glossary section. In the glossary, all terms in the course are defined, and external links provided to lead to more-detailed information about each term and concept. In addition, a communication form was provided so that students could immediately enter a suggestion for an addition to the glossary, or ask for clarification. The instructor would then respond, sometimes with an email, sometimes with a new entry in the glossary, sometimes by a further comment during the next face-to-face session.

Student Evaluation of the Course

At the conclusion of the course, the students responded to a questionnaire embedded directly in the course environment. The questionnaire contained 22 multiple-choice questions and 12 open questions. Among the main results of the evaluation are the following points:

- In general, the students enjoyed the site and especially appreciated the well-organized extra resources.

- The students immediately contributed to the site by adding their own PowerPoint presentation materials to support their class presentations. The students indicated they planned to continue using the resources for other courses.
- Although they appreciated the follow-up assignments, they often did not have time to carry them out if they were not given points but only offered on a voluntary basis.
- Students need an initial demonstration of the site, and how to use its features such as the shared workspace and the facilities for uploading and downloading files and giving comments. Students do not read the user manuals provided.
- Students appreciated being able to read the contributions of other students in the shared workspace.
- Students made particular use of the site when studying for the examination.
- Students appreciated a convenient way to communicate among themselves and with the instructor.

The students did make constructive critical comments about the design of the site, and the manner of integrating it into the course (i.e., its fit with the instructional design of the course). In particular, while they appreciate rich resources, they feel they lack the time to exploit them unless this time is included in the marking scheme of the course. This is especially true with discussions; in order to get a critical mass of discussion activity, students appreciate the stimulus of getting points for their contributions. Students also commented that learning from each other also has limitations: *Learning form the presentations of others is not always good, because they can tell wrong things or they cannot explain well. When the instructor explains, it is interesting, but there is often not enough time because of student presentations.* An evaluation of the 1998-1999 cycle of the course will be presented at the ED-MEDIA '99 conference.

Discussion

The site was used as a support for the course, to lead the students to decide for themselves what extra materials they wish to select and study. The goal is to support their increased self-responsibility for learning. But students also need a push, or a reward; in the following cycle of the course, points will be given to acknowledge participation in the discussions. The most important function of the course site was to stimulate a more active learning process among the students, by providing valuable exercises and letting them participate in building the course site by finding or creating resources and sharing them with others. The purpose of the course site is more than putting instructional content in a form ready for study. If our aim as instructors is to coach students to think critically and to reason about concepts and issues, as well as having the ability and motivation for learning independently, then the instructional design of the course-support site should reflect these aims. For example, using the site to search for additional, and relevant, information and examples, and presenting them within the site so that the other students could reflect on each others' choices is a valuable activity for our aims. In the case of students all working in a language which is not their mother tongue (English), the asynchronous nature of the course site allowed them the time to construct their responses without the difficulties of speaking spontaneously.

Extending our experiences to other types of courses

Although this case study has focused on a particular course, it is our experience from working with the instructors of 30 courses within our faculty during the past year that our main conclusions are relevant to a large variety of courses. With all of these courses, the following guidelines have been appropriate, although the way of realizing them varies considerably from course to course:

- A WWW-based course-support environment should extend the boundaries of the traditional teaching that occurs in the classroom.
- It should support while challenging students' thinking.
- It should include a resource center for the investigation of a variety of information, with an emphasis on the students evaluating this additional information in terms of its meaningfulness to the course.
- It should support discussion, exchange of ideas, and peer evaluation, and these activities should be part of the graded activities in the course.
- It should allow the students to organize and restructure information as well as create and contribute their own resources.
- It should present a convenient way for students to participate in collaborate work and in the communication of ideas and questions, in ways that cannot take place in the classroom due to restricted time and the difficulty of making reflective comments in a classroom setting.

Critical to all of this is a user interface that makes contribution to the course site simple for both the instructor and students. Thus other major requirements in terms of the instrumentation of the course site are:

- The course site should allow students and the instructor to enter comments, and upload and download files, without having to know any technical aspects of the process.
- The access to the course site should be through the usual WWW browser, requiring no separate software for either instructor or students.
- All course-support resources should be integrated within a single WWW environment.
- Students should be co-builders of the course resources, and thus need to be able to see and give comments on the entries of their peers into the course site. Thus the course environment must grow during the process of the course, based on student entries, and thus must be flexible technically to handle this and still maintain the underlying database relationship.

Conclusion: Toward an Instructional Design for Course-Support Environments

The value of a WWW-based course-support environment depends entirely on how the environment is designed and how it is integrated into the rest of the teaching-learning process. But because of the newness of the WWW, instructional-design models for the whole instructional communication in which WWW sites are included have to be

developed. Such models could retain the skills and insights of the personal instructor and at the same time make use of the time involvement, specialisation skills, sophisticated tools, and task division possible in the professional development team (Collis & De Boer, 1998b). This is the situation now at the University of Twente. We hope that the guidelines suggested in this article can contribute to an instructional-design model for courses making use of WWW-based support environments.

Note: This paper is a shorter version and revision of Dijkstra, Collis, & Eseryel (1998).

References

Collis, B., & De Boer, W. (1998a). *How do instructors design a Web-based course-support environment?* Paper presented at ED-MEDIA '99.

Collis, B., & De Boer, W. (1998b). The TeleTOP Decision Support Tool (DST). In J. van den Akker, N. Nieveen, & Tj. Plomp (eds.), *Design methodology and development research in education and training*, (in press). Dordrecht: Kluwer Academic Publishers.

Dijkstra, S., Collis, B., & Eseryel, D. (1998). Instructional design for tele-learning. *Journal of Computing in Higher Education*, 10(2), 3-18.

Dijkstra, S., Seel, N., Schott, F. & Tennyson, R.D. (Eds). (1997). *Instructional Design: International Perspectives,* (Vol. 2*)*. Mahwah, NJ: Lawrence Erlbaum Associates, Publishers.

Tennyson, R.D., Schott, F., Seel, N., &. Dijkstra, S. (Eds). (1997). *Instructional Design: International Perspectives,* (Vol. 1*)*. Mahwah, NJ: Lawrence Erlbaum Associates, Publishers.